# Sandul Henry

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## EDUCATION

**University of California, San Diego**      **Sept. 2023 – June 2027**
*B.S. in Computer Engineering – GPA: 3.9*      *San Diego, CA*

- **Relevant Courses:** Linear Algebra, Analog Design, Advanced Data Structures and Object-Oriented Design, Discrete Mathematics, Calculus I/II/III, and Systems Programming
- **Awards:** Provost Honors (6 times)

## EXPERIENCE

**Embedded Systems Subteam Member**      **Fall 2024 – Present**
*Yonder Dynamics*      *San Diego, CA*

- Participated as a member of the embedded systems Software Engineering subteam on an undergraduate design team, preparing a robot to compete in the University Rover Challenge.
- Wrote programs in C++ and Python to drive motor functions, and to support deterministic arm movement using inverse kinematics.
- Code written contributed to the overall success of the robot, and enabled other sub teams to perform tasks, such as moving the robotic arm to interact with buttons in competition.

**Pool Lifeguard**      **May 2022 – Present**
*City of Los Angeles, Dept. of Rec. and Parks*      *Los Angeles, CA*

- Responsibilities included supervising a pool area, teaching individual lessons, teaching lessons to those with special needs, coaching a group swim team, and teaching group introductory swim lessons.

## PROJECTS

**Radio Astronomy Online Service** | hlineobs.com | *HTML/CSS/JS, Python, SQL*      **Jun. 2025**

- Built a remote radio astronomy system designed to observe the hydrogen spectrum; developed Python DSP pipelines to process signals and generate visualizations (e.g., PSD vs. time); built an automated data pipeline to email users automatically.
- Designed a Flask backend with PostgreSQL to manage and store experiment requests, status updates, and communication between the Pi and web interface.
- Developed an educational frontend in HTML, CSS, and JavaScript, allowing users to define and submit custom observation experiments through a web interface.

**C++ Electrostatics Simulation** | *C++, OpenGL*      **May 2025**

- Built a C++ simulation engine to compute and visualize electrostatic forces and potentials from multiple charge configurations.
- Implemented numerical algorithms for field calculation and interactive 2D visualization using OpenGL.
- Optimized data structures for efficient real-time rendering and computation.

**Spotify Playlist Categorization** | *Python, data analysis*      **Dec. 2023**

- Developed a Python application to analyze Spotify playlists and apply k-means clustering for grouping tracks by quantifiable traits (e.g., tempo, energy, danceability).
- Implemented data preprocessing and feature extraction pipelines to standardize audio attributes for clustering.
- Visualized results using Matplotlib to display cluster characteristics and comparative trait distributions.
- Applied data analysis methods (i.e. k-means clustering) to generate personalized insights into playlist structure and music similarity.

## TECHNICAL SKILLS

**Languages**: Python, C, C++, ARM Assembly Java, Javascript, HTML, CSS
**Frameworks**: React, Flask
**Developer Tools**: Git, Docker, Google Cloud Platform, VS Code, Visual Studio, PyCharm
**Libraries**: pandas, NumPy, Matplotlib, pyLab